Space Weather Forecast

Issued on Friday, 25 March 2022 at 01:01 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance R1/R2 Radio Blackouts throughout. Chance G1/Minor Storms day 2 and 3 (26th and 27th).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the last 24 hours with a number of common-class flares occurring. These were mainly from the pair of bipolar sunspot regions in the northeast, which includes one moderately sized region. A further common-class flare was also observed from the other much smaller sunspot region on the disc, in the southeast, which is now a unipolar region. No Earth-directed Coronal Mass Ejections (CMEs) were observed in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind was enhanced by the arrival of the faster winds from a coronal hole, with speeds reaching elevated levels of around 550-600km/s for a time today, before easing a little. This was after a brief period of Moderately strong magnetic field, occurring just after midnight, before easing through the day. This included a brief spell of the north-south component being negative (southward pointed), before becoming mainly positive (northward). Consequently one Active geomagnetic interval occurred 24/0000-0300 UTC, but otherwise remained Quiet to Unsettled.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Common-class X-ray flares are expected in the period, with a daily slight chance of moderate-class. Further sunspot regions are also expected to rotate onto the facing side over the next four days, with the outlook potentially seeing an increase in flare risk - the degree to which this occurs pending these arrivals for analysis.

Solar Wind / Geomagnetic Activity: A CME from the 20th may arrive early on day 1 (25th) but is expected to be very weak and largely imperceptible. No other CME arrivals are expected. Current solar elevated solar winds are forecast to decline day 1 and 2 (25th/ 26th), before the arrival of further fast winds from CH69 later day 2 (26th). Solar winds are likely to become elevated, before easing again later day 3 and day 4 (27th and 28th). Quiet, isolated Unsettled, geomagnetic activity at first is expected to become Active with a chance of G1/Minor Storm intervals later day 2 and day 3 (26th/27th), before easing to Quiet to Unsettled day 4 (28th)

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background with no solar radiation storms occurring. There is a very slight chance of count rates increasing however, due to the moderately sized sunspot in the northeast, should any large flares occur. Although this region is currently in an unfavourable location for producing solar radiation storms at Earth.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	40	30	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	25	25	25	25
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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